

REMARKS

Claims 1 through 26 were presented for examination. Claims 1 through 20 have been examined. Claims 21 through 26 were withdrawn from consideration pursuant to the restriction requirement and have now been canceled. Claims 1-3, 5 and 9-15 were rejected under Section 102(b) as being anticipated by WO '250. Claims 1-15 are rejected under Section 103(a) as being unpatentable over the same reference. Claims 8 and 9 were objected to for failing to further limit the subject matter of a previous claim. Claims 17-19 were objected to for the same reason. Claims 12-14 were rejected under Section 112 because there was insufficient antecedent basis for the term "the Group VIII metal." New claims 27-31 have been added to more particularly point out preferred embodiments of the present invention. The Examiner's rejections are respectfully traversed.

In paragraph 19 on page 7 of the office action, the Examiner indicated that claims 4, 6-8, and 16-20 were objected to but would be allowable if rewritten in independent form. New claim 29 represents claim 4 rewritten in independent form. New claim 30 represents claim 6 rewritten in independent form. New claim 31 represents claim 8 rewritten in independent form.

Claims 8 and 9 were objected to for failing to further limit the subject matter of a previous claim. Claim 1 specifies that X^1 and X^2 represent a cyclic group with at least 5 ring atoms. Claim 8 further limits claim 1 by specifying that either or both of X^1 and X^2 represent a phospho-bicycloalkyl group with at least 6 carbon atoms. Claim 9 further limits claim 1 by specifying that both X^1 and X^2 have 6 to 12 ring atoms.

Claims 17 through 19 were objected to for failing to further limit the subject matter of a previous claim. These claims have been amended to remove "at least" and specify a carbon atom range.

Claims 12-14 were rejected under Section 112 as being indefinite because of the use of the term "the Group VIII metal." These claims have been amended to include the term "source of Group VIII metal" which does have proper antecedent basis in claim 1.

The present invention requires the use of a diphosphine ligand which incorporates a bivalent optionally substituted bridging group which is connected to each phosphorus atom by a sp^2 hybridized carbon atom. A sp^2 hybridized carbon atom is defined at the top of page 3 of the specification as a carbon atom involved in a double bond, as in ethylene.

The reference cited by the Examiner simply does not disclose any diphosphine ligand having a bivalent bridging group which is connected to each phosphorus atom by a sp^2

hybridized carbon atom. The reference lists a number of "preferred bidentate diphosphines of formula II" starting at the bottom of page 9 and carrying over onto page 10. None of these preferred bidentate diphosphines incorporates a bridging group wherein even one phosphorus atom is connected to a sp^2 hybridized carbon atom. The bridging groups described in these bidentate diphosphines are ethane, propane, butane, pentane, cyclopentane and cyclohexane. Furthermore, none of the bidentate diphosphine ligands used in the examples have a connection of a phosphorus atom to a sp^2 hybridized carbon atom.

Since the preferred materials listed in the reference are not diphosphine ligands which have a bridging group which is connected to each phosphorus atom by a sp^2 hybridized carbon atom, it seems clear that the reference does not disclose bridging groups which have sp^2 hybridized carbon atoms connected to each of the phosphorus atoms. The Applicants assert that claims 1-3, 5, and 9-15 are not anticipated by the reference.

As discussed above, the reference does not point to or prefer the use of bridging groups wherein each phosphorus atom is connected to a sp^2 hybridized carbon atom. The Applicants assert that it is not obvious to use such bridging groups in view of the disclosure of the cited reference. Table I on pages 20 and 21 of the specification of the present invention gives the results of Examples 4-8 and Comparative Examples A-D. A comparison of the results of Example 5 utilizing a bidentate phosphine within the scope of the claims of the present invention and Example B utilizing a bidentate diphosphine of the type described in the reference shows that the invention bidentate diphosphine is more active towards the desired hydroformylation product, the alcohol, than the bidentate diphosphine of the prior art reference. A similar comparison with similar results can be made between Example 7 of the present invention and Example C of the reference. The same results are shown by comparison of the results in Example 9 which is of the present invention and Example D which is of the prior art.

The results in Table II relate to diene tolerance in the feed. It can be seen by comparison of the results of Example 10, which utilized a bidentate diphosphine of the present invention, and Example E, which utilized a bidentate diphosphine of the prior art, that the bidentate diphosphine of the present invention is more tolerant towards a feed containing dienes than is the prior art bidentate diphosphine.


The Applicants assert that the results in the experiments discussed above are not disclosed by nor suggested by the cited reference. These results clearly show the superiority of the use of bidentate diphosphine ligands with bridging groups within the scope of the present invention, i.e., having a sp^2 hybridized carbon atom connected to each phosphorus atom, as

opposed to bidentate diphosphine ligands with bridging groups such as described by the cited reference. For this reason, the Applicants assert that they have provided a showing of nonobviousness and assert that the Section 103 rejection should be withdrawn.

For the reasons discussed above, the Applicants assert that the claims as amended overcome all of the rejections and an early notice of allowance is respectfully requested.

Respectfully submitted,

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